



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,289	09/16/2003	Jung Kan Lin	MR1035-1311	9823
4586	7590	02/16/2005	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			ZARNEKE, DAVID A	
			ART UNIT	PAPER NUMBER
			2829	

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/662,289

Applicant(s)

LIN, JUNG KAN

Examiner

David A. Zarneke

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, US Patent 5,226,723, in view of Applicant's admitted prior art (hereafter APA).

Chen (figure 4) teaches a structure of Surface Mount Device Light Emitting Diode (SMD LED), including:

a printed circuit board [10] with a metal reflection cup [11] set concavely on the printed circuit board;

at least one LED chip [12] bonded onto the metal reflection cup and electrically connected (using wire [13]) to the printed circuit board.

Chen fails to teach the use of an encapsulant that is formed over the LED chip and protrudes from the surface of the printed circuit board for forming a desired shape.

Applicant's admitted prior art (figure 1) teaches an encapsulant (18 and 22 combined) that is formed over the LED chip and protrudes from the surface of the printed circuit board for forming a desired shape.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the encapsulant of APA in the invention of Chen because the use of an encapsulant protects the LED from the environment.

The claims as presently written, do not define around the use of multiple encapsulants. The use of "comprising" language and by stating "an encapsulant" does not preclude the use of a multi-layered encapsulant system, as in the prior art.

Regarding claim 2, APA teaches the printed circuit board and the encapsulant are composed of two materials that have the same or similar expansion coefficient and contraction coefficient.

With respect to claim 3, APA teaches the encapsulant can be formed in the shape of a hemisphere, a cylinder, an ellipse, or any other shape.

As to claim 4, the limitation that the encapsulant is formed using a molding process is a product-by-process limitation and therefore is given no patentable weight. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

In re claim 5, APA teaches the encapsulant is an epoxy or the like (specification, page 1, line 24 – page 2, line 2).

Regarding claim 6, while both Chen and APA both fail to teach a single or a plurality of grooves is provided at each of the two sides of the printed circuit board, barring a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a single or a plurality of grooves is provided at each of the two sides of the printed circuit board because it is an obvious matter of design choice. One of ordinary skill would know to use a groove or plural grooves in order to facilitate convenient solder reflow. Design choices and changes of size are generally recognized as being within the level of ordinary skill in the art (MPEP 2144.04(I), (IVA) & (IVB)).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeager et al., US Patent 6,507,049, in view of Chen, US Patent 5,226,723.

Yeager (figure 2) teaches a structure of Surface Mount Device Light Emitting Diode (SMD LED), including:

a carrier substrate [17] with a metal reflection cup [21] set concavely on the carrier substrate;

at least one LED chip [4] bonded onto the metal reflection cup and electrically connected (through electrodes [23]) to the printed circuit board; and.

an encapsulant [11] that is formed over the LED chip and protrudes from the surface of the printed circuit board for forming a desired shape.

Yeager fails to specifically identify the carrier substrate as being a printed circuit board (PCB).

Chen teaches a LED comprising mounting a LED [3] on a PCB [1].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the PCB of Chen in the invention of Yeager because Chen teaches that the use of a PCB as the substrate is widely used because of its low cost, its production is easy, and it is easy to match intensity and color (1, 8-16).

Regarding claim 2, Yeager teaches the printed circuit board and the encapsulant are composed of two materials that have the same or similar expansion coefficient and contraction coefficient.

With respect to claim 3, Yeager teaches the encapsulant can be formed in the shape of a hemisphere, a cylinder, an ellipse, or any other shape.

As to claim 4, the limitation that the encapsulant is formed using a molding process is a product-by-process limitation and therefore is given no patentable weight. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

In re claim 5, Yeager teaches the encapsulant is an epoxy or the like (abstract).

Regarding claim 6, while both Chen and Yeager both fail to teach a single or a plurality of grooves is provided at each of the two sides of the printed circuit board, barring a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a single or a plurality of grooves is provided at each of the two sides of the printed circuit board because it is an obvious matter of design choice. One of ordinary skill would know to use a groove or plural grooves in order to facilitate convenient solder reflow. Design choices and changes of size are generally recognized as being within the level of ordinary skill in the art (MPEP 2144.04(I), (IVA) & (IVB)).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koay et al., US Patent 6,806,583, in view of Chen, US Patent 5,226,723.

Koay (figure 2) teaches a structure of Surface Mount Device Light Emitting Diode (SMD LED), including:

- a planar substrate [210], that could be a board (3, 30+), with a metal reflection cup (figure 8, [800 and 810] set concavely on the printed circuit board;

- at least one LED chip [230] electrically connected (through wires [240]) to the printed circuit board; and

- an encapsulant [260] that is formed over the LED chip and protrudes from the surface of the printed circuit board for forming a desired shape.

Koay fails to specifically identify the carrier substrate as being a printed circuit board (PCB).

Chen teaches a LED comprising mounting a LED [3] on a PCB [1].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the PCB of Chen in the invention of Koay because Chen teaches that the use of a PCB as the substrate is widely used because of its low cost, its production is easy, and it is easy to match intensity and color (1, 8-16).

Regarding claim 2, Koay teaches the printed circuit board and the encapsulant are composed of two materials that have the same or similar expansion coefficient and contraction coefficient.

With respect to claim 3, Koay teaches the encapsulant can be formed in the shape of a hemisphere, a cylinder, an ellipse, or any other shape (3, 58+).

As to claim 4, the limitation that the encapsulant is formed using a molding process is a product-by-process limitation and therefore is given no patentable weight. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Yet, for completeness, Koay does teach the use of molding to form the encapsulant (6, 10+).

In re claim 5, Koay teaches the encapsulant is an epoxy or the like (6, 11+).

Regarding claim 6, while both Chen and Koay both fail to teach a single or a plurality of grooves is provided at each of the two sides of the printed circuit board,



Art Unit: 2829

barring a showing of unexpected results, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a single or a plurality of grooves is provided at each of the two sides of the printed circuit board because it is an obvious matter of design choice. One of ordinary skill would know to use a groove or plural grooves in order to facilitate convenient solder reflow. Design choices and changes of size are generally recognized as being within the level of ordinary skill in the art (MPEP 2144.04(I), (IVA) & (IVB)).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art cited but not relied upon teach the state of the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (571)-272-1937. The examiner can normally be reached on M-F 7:30 AM-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Baumeister can be reached on (571)-272-1712. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2829

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "David A. Zarneke", is written over the printed name.

David A. Zarneke  
Primary Examiner  
February 14, 2005